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Sagol

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(54) **COLLAPSIBLE WORKTABLE**

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A47B 91/00 (2006.01)

(52) **U.S. Cl.** **108/115**; 108/153.1; 108/157.1; 108/159.11

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See application file for complete search history.

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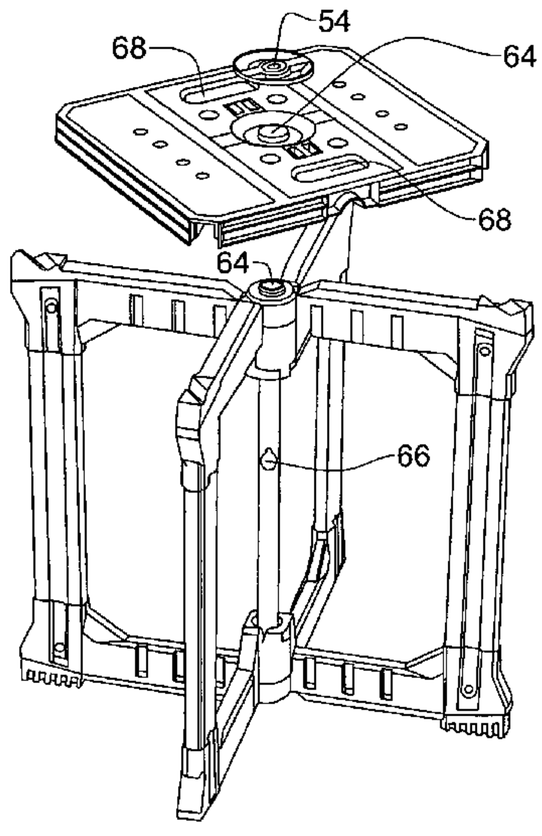
(57) **ABSTRACT**

The invention relates to a worktable including a work-plate mountable on a support structure, the support structure comprising at least two frames, each frame being either an integral frame or comprising two or more frame members, articulated to one another along a vertical axis, and being pivotally displaceable with respect to one another between an open position and a collapsed position, forming, in the open position, a work-plate bearing structure, and being, in the collapsed position, flush with one another and providing a storage space for the work-plate. The work-plate being rigidly attachable to the work-plate bearing structure of the support structure.

15 Claims, 5 Drawing Sheets



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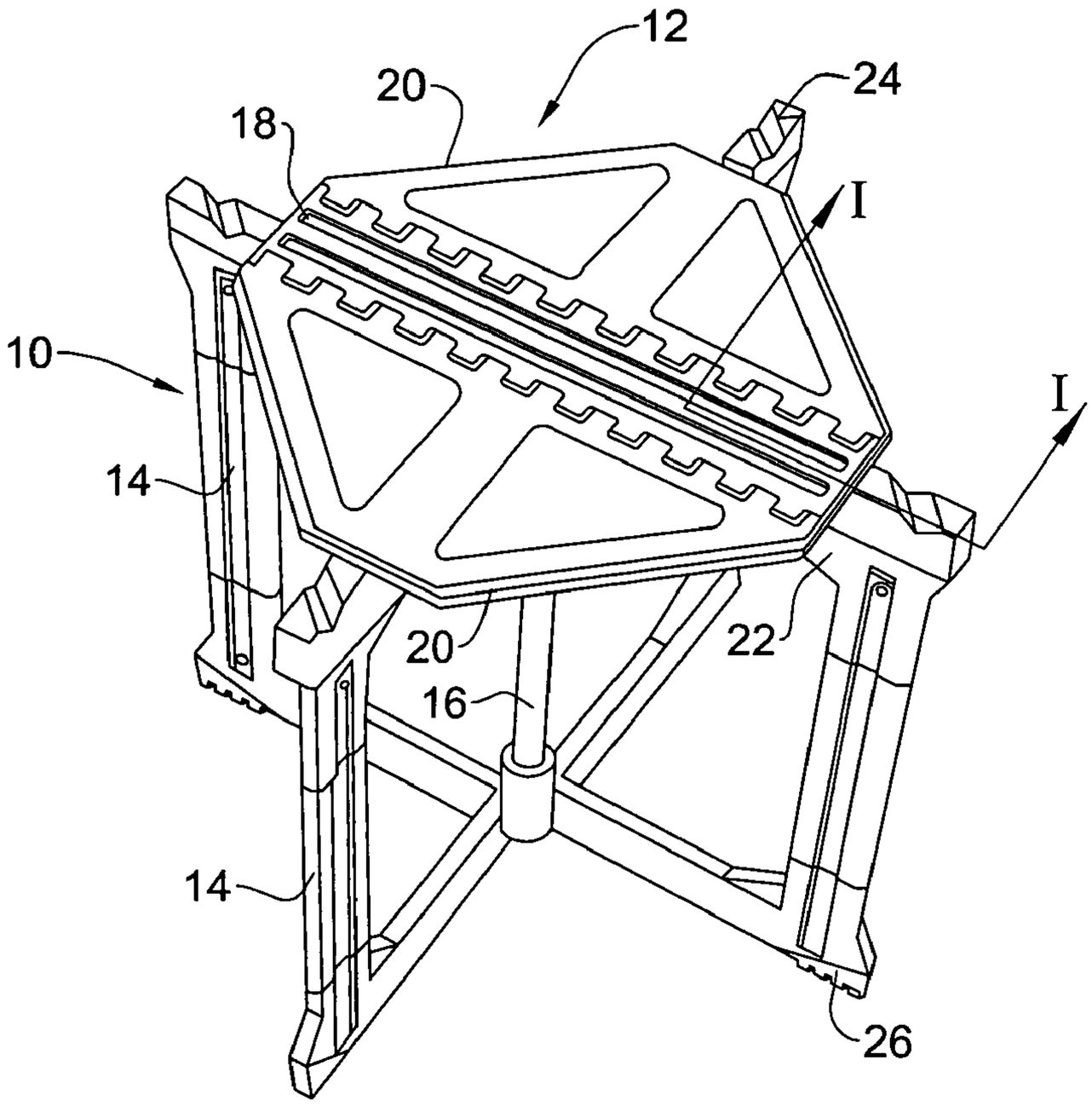

FIG. 1

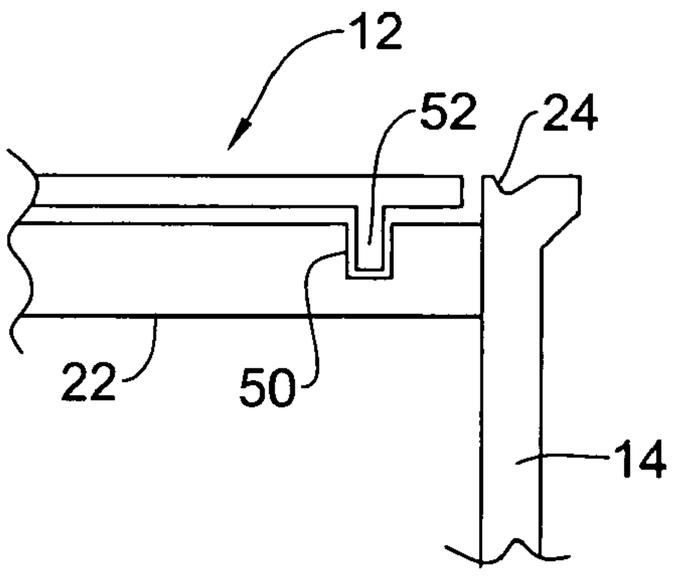

FIG. 1A

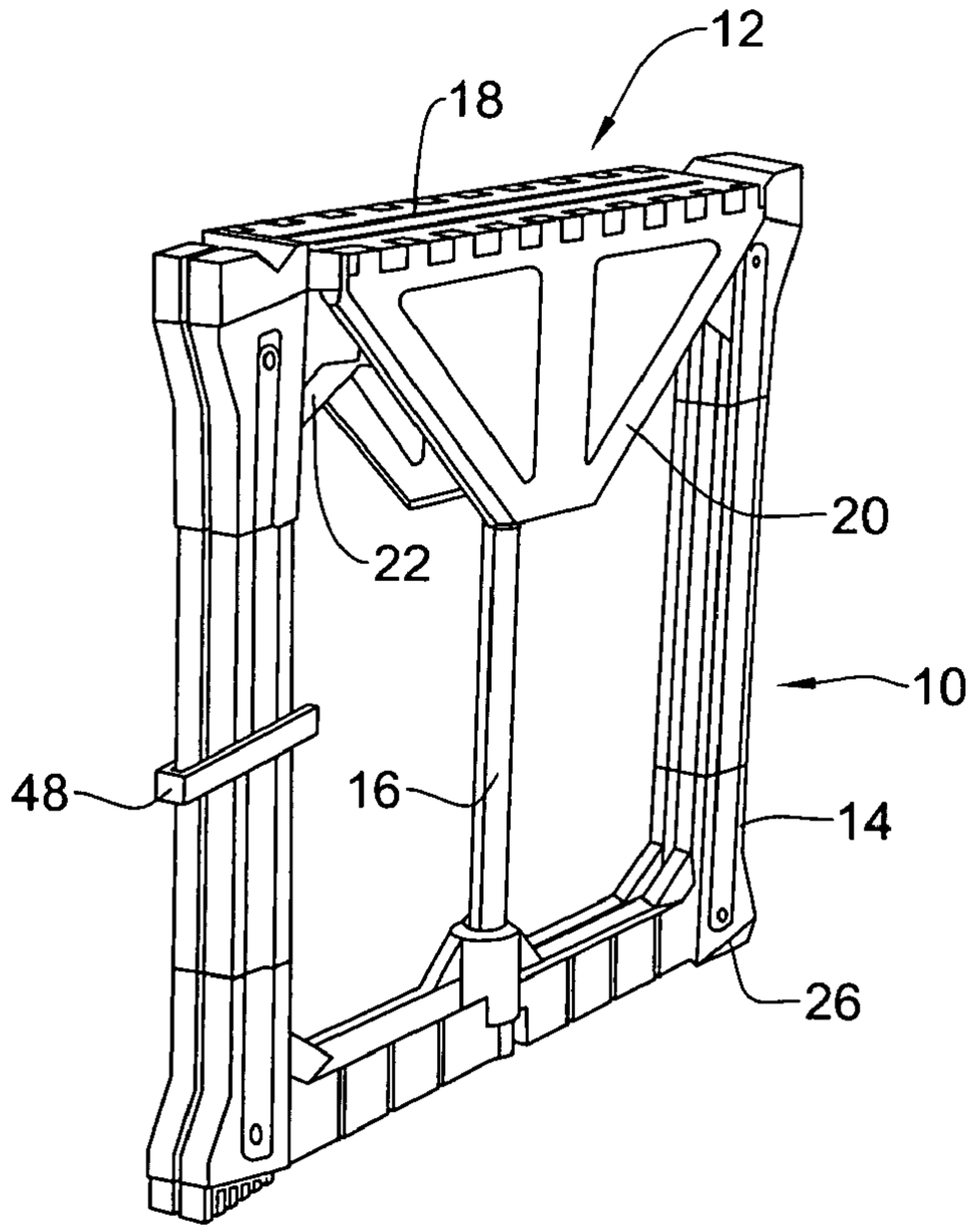

FIG. 2

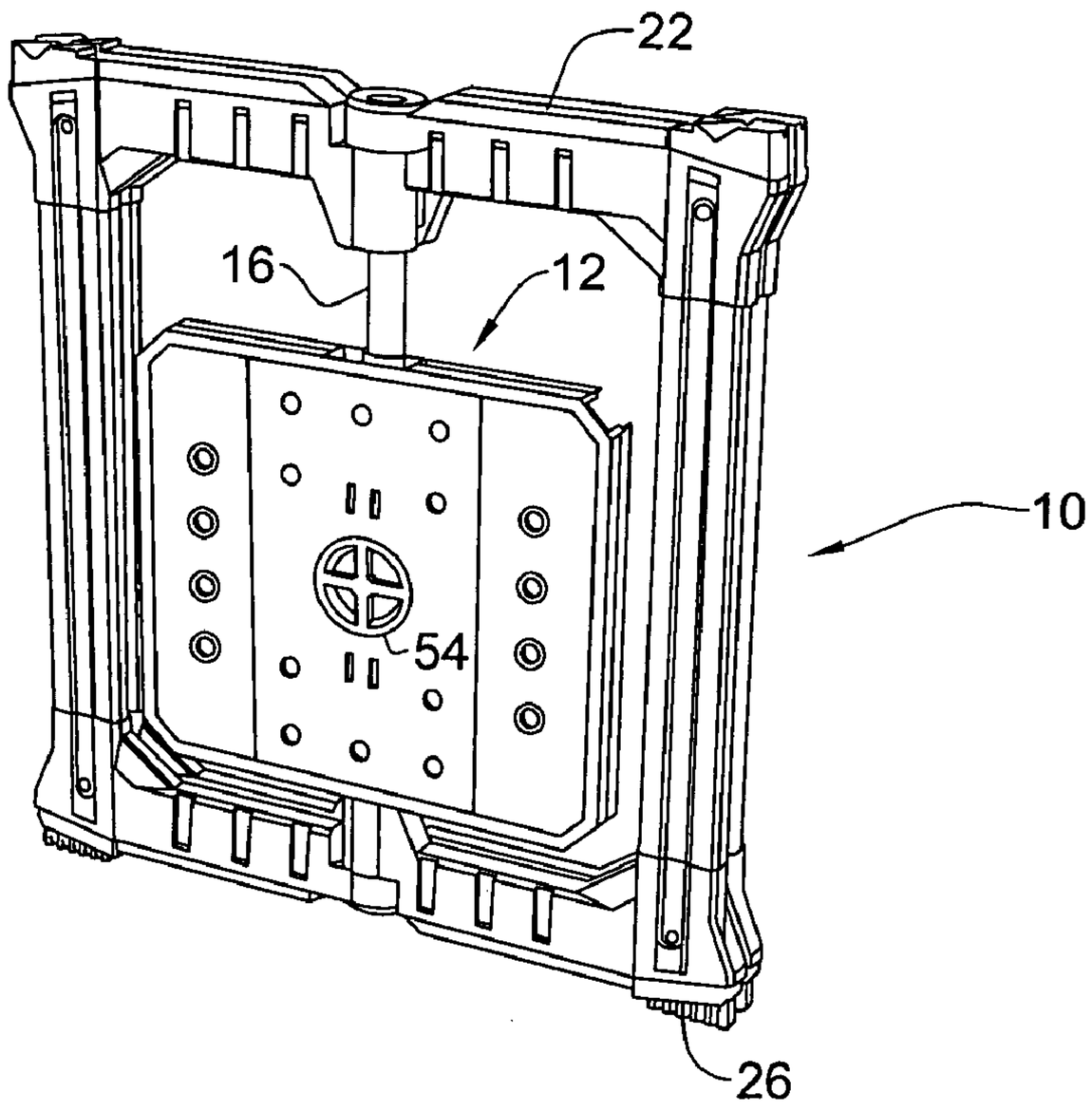

FIG. 3

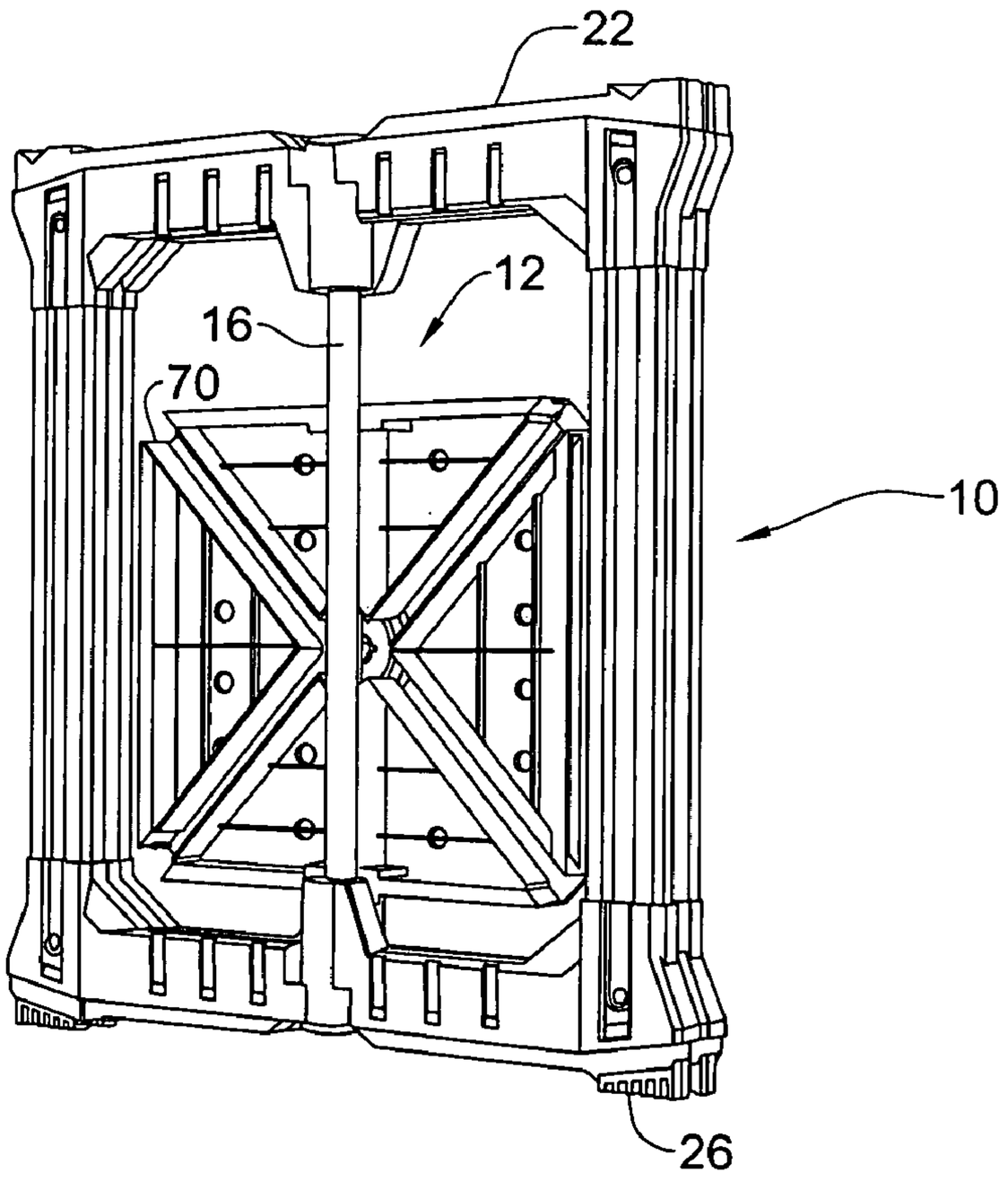

FIG. 3A

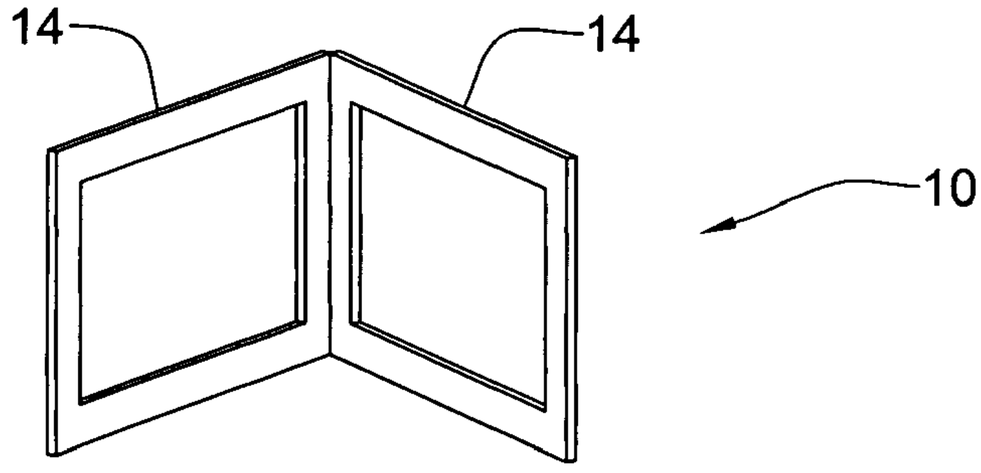

FIG. 4

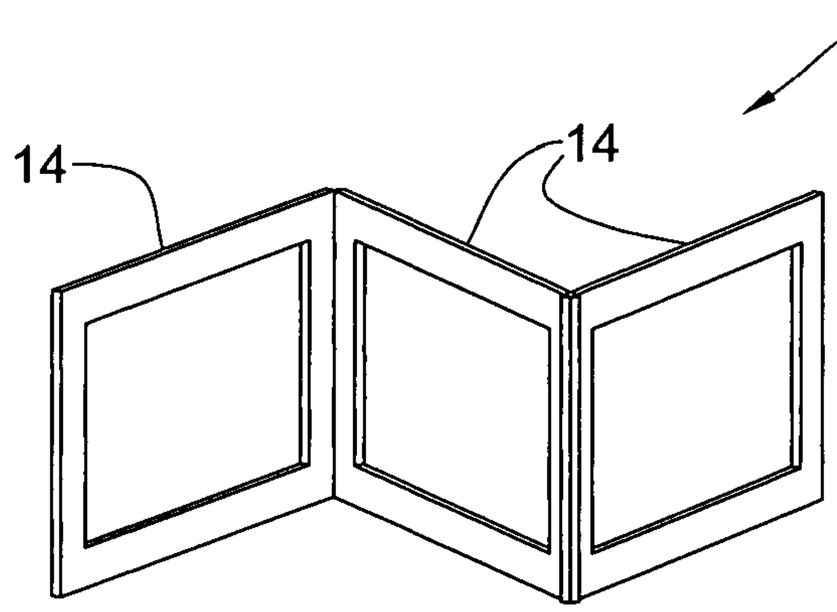

FIG. 5

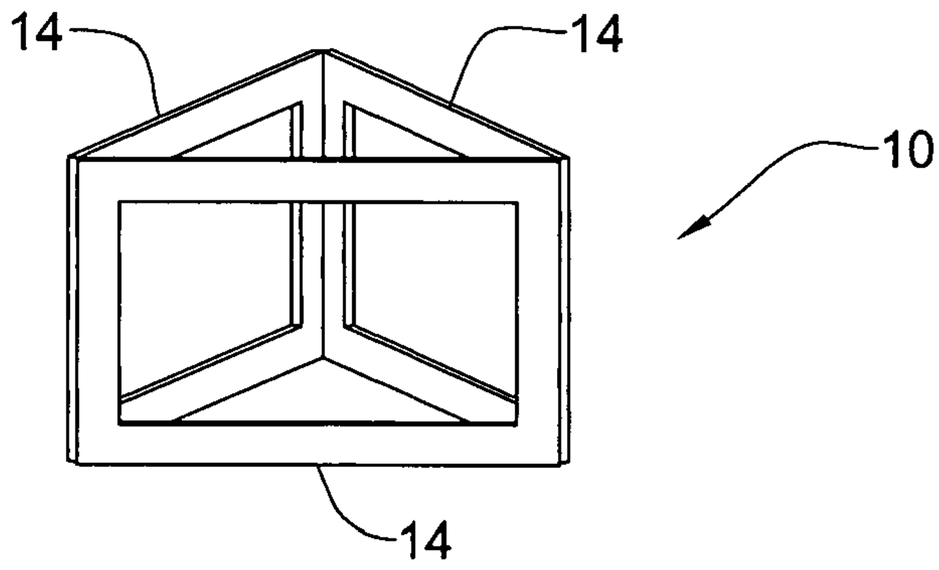

FIG. 6

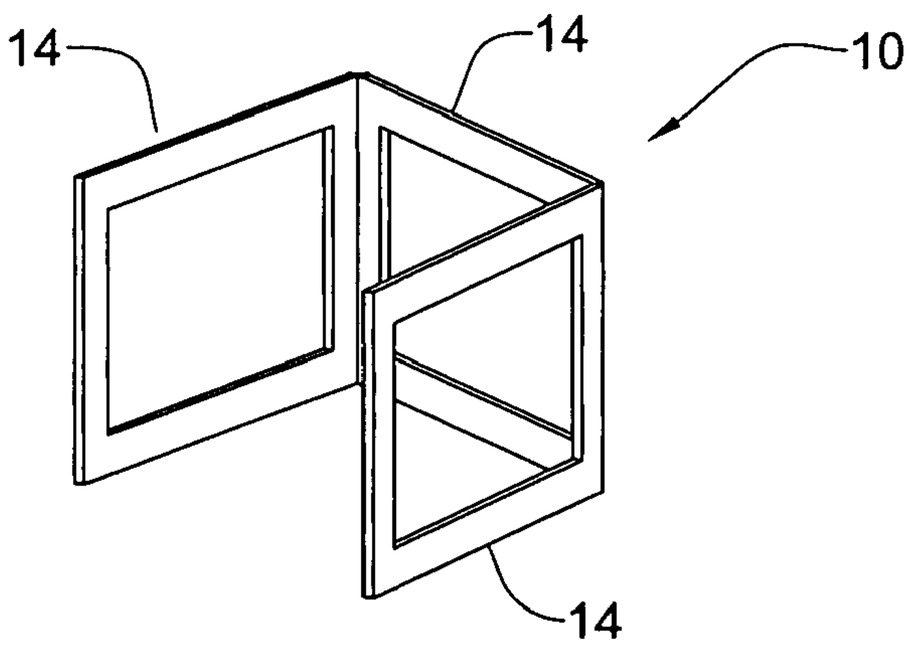

FIG. 7

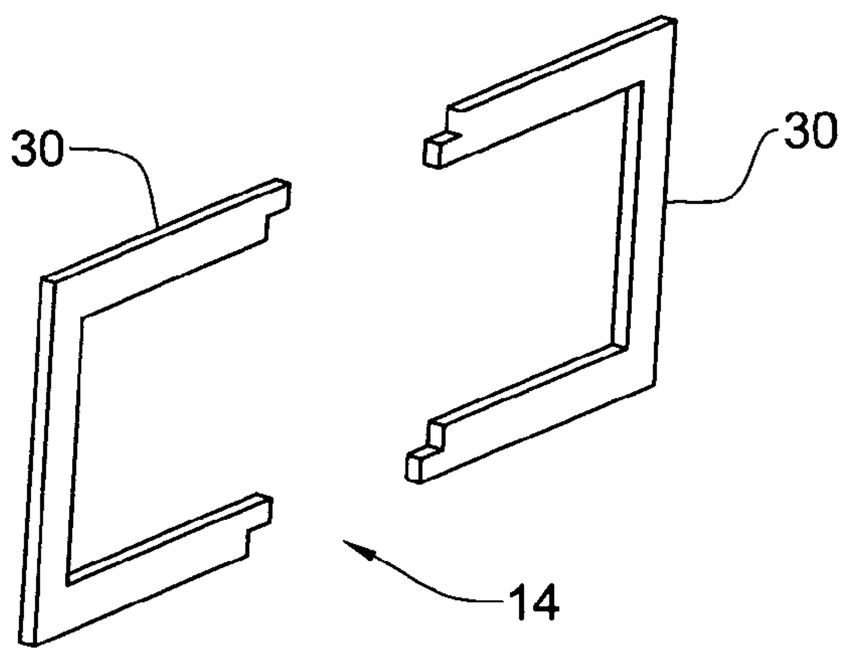

FIG. 8

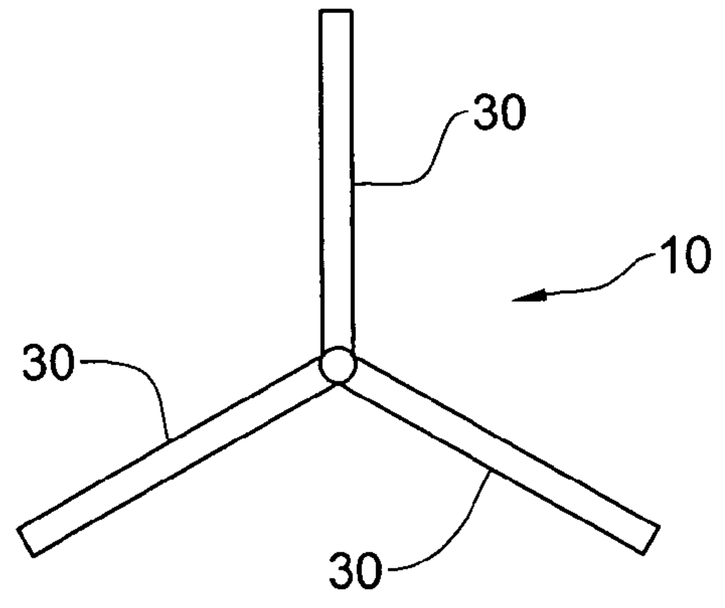

FIG. 9

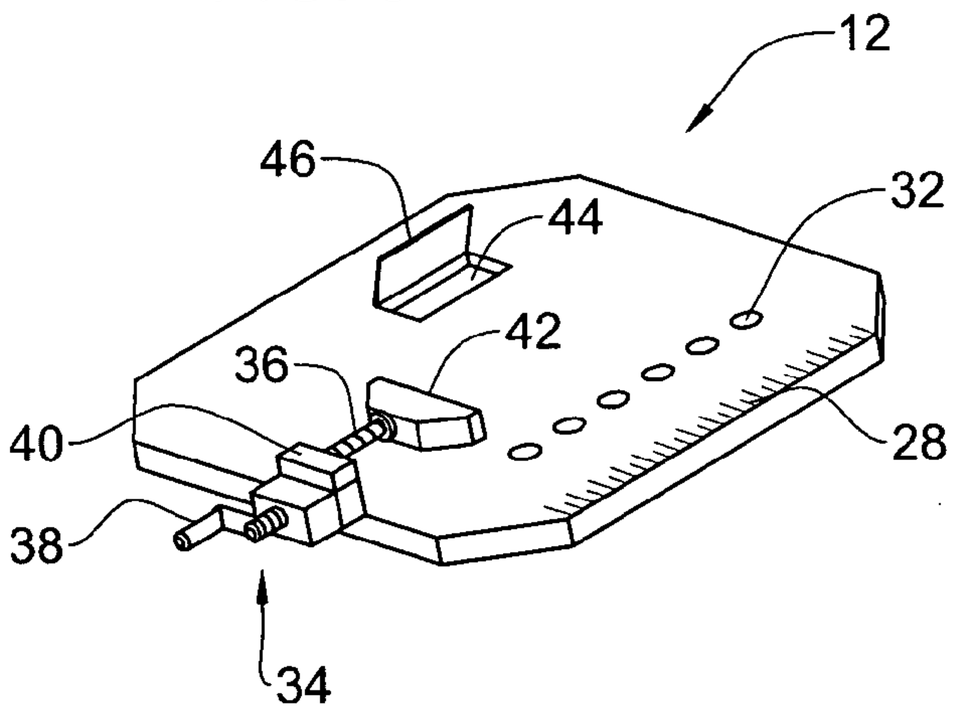

FIG. 10

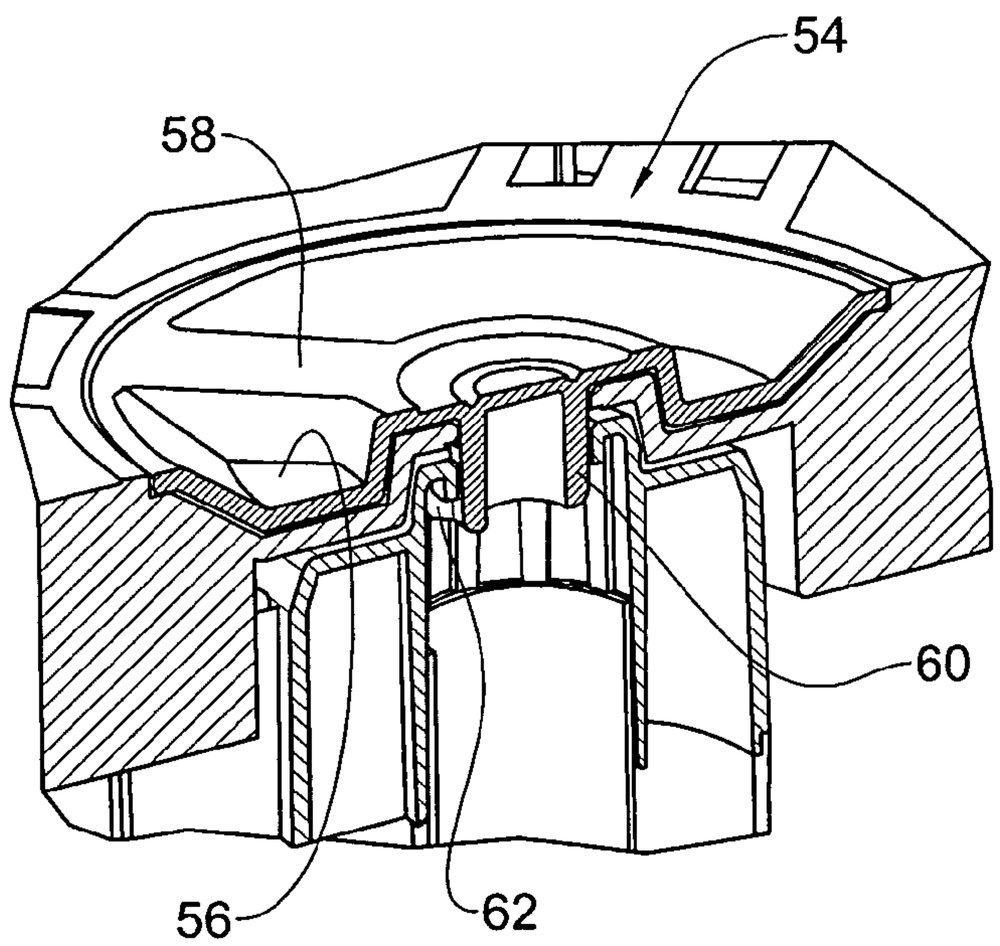

FIG. 12

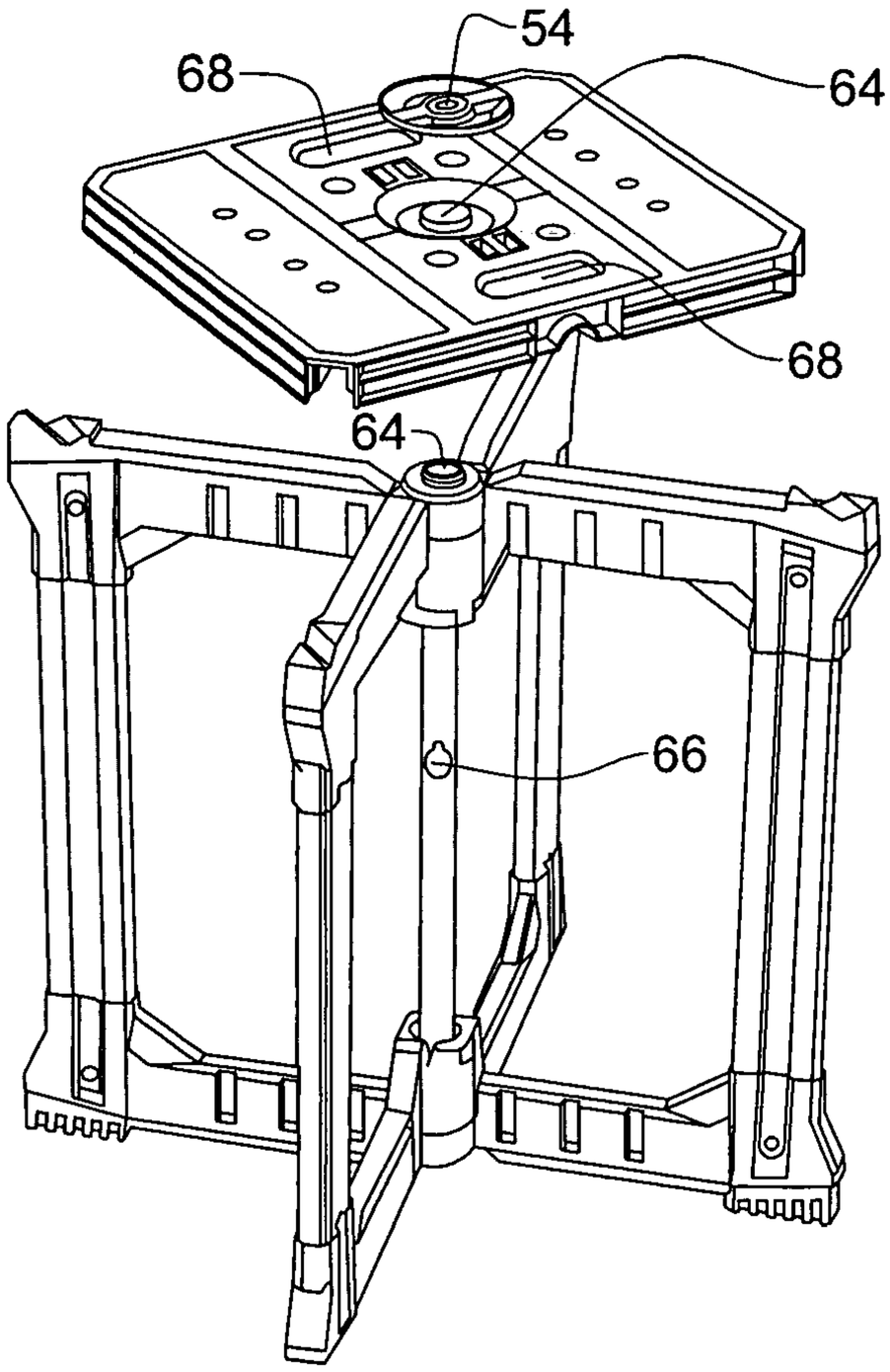

FIG. 11

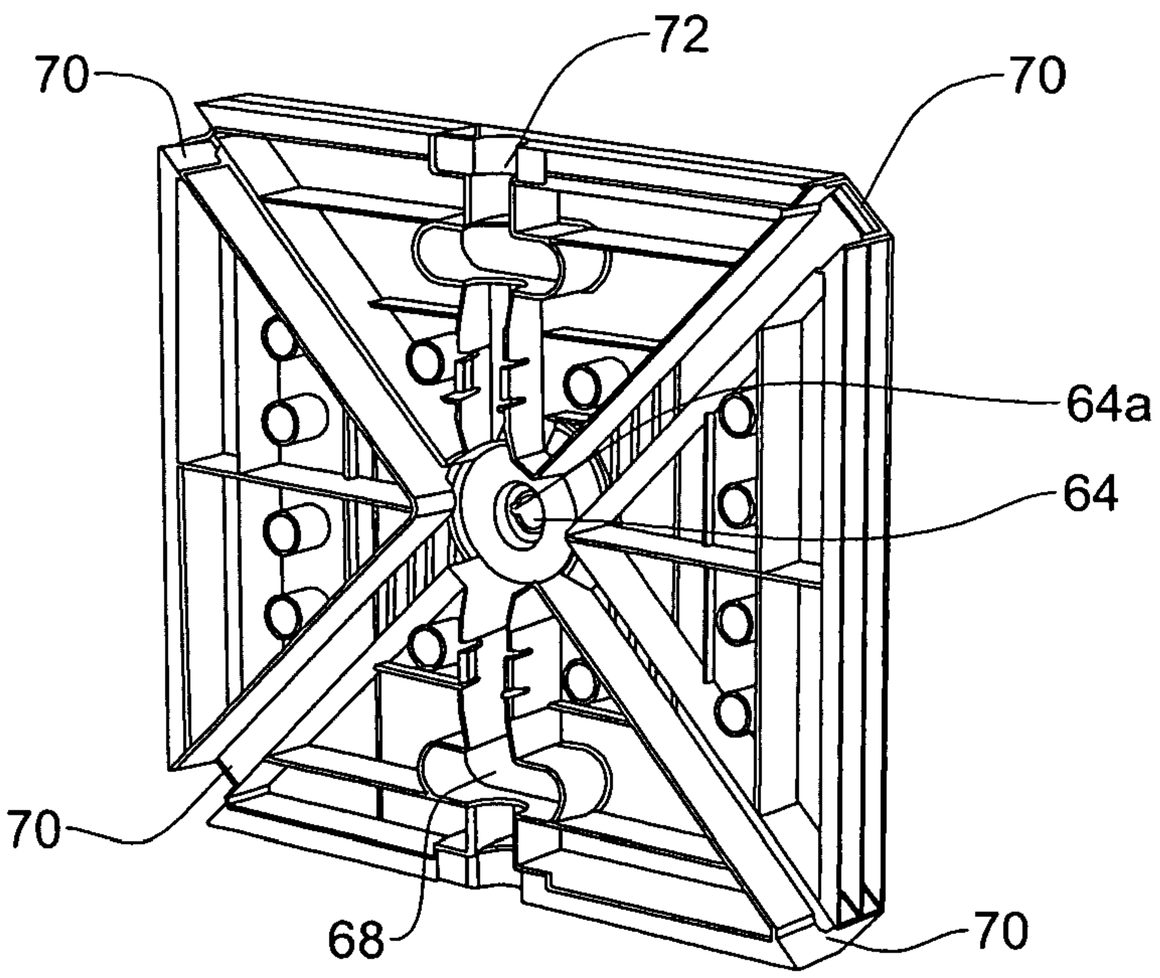

FIG. 13

COLLAPSIBLE WORKTABLE

FIELD OF THE INVENTION

The present invention is generally in the field of worktables and in particular it is concerned with such a portable and collapsible worktable.

The term "worktable" as used hereinafter in the specification and claims refers also to "work benches", "saw horses", "sawbucks", etc.

BACKGROUND OF THE INVENTION

A myriad of worktables are available on the market and many patents are directed to various such worktables, most of which typically comprise a work surface (work-plate) and a support structure which in many cases one or both is collapsible.

A variety of patents are concerned with different aspects of the support structure and their collapsing/folding while other patents are directed to features of the work surface and different accessories therefor.

U.S. Pat. No. 3,669,031 discloses a collapsible work table which is designed for carrying power tools. In the open position, it comprises a work surface with a means for mounting a tool (such as a power saw), with one set of adjacent legs containing wheels for portability between two proximate locations. In the event that the table needs to be transported a great distance, the table is collapsible.

U.S. Pat. No. 4,102,555 discloses a collapsible, multiple shelf work table. The support structure provided is simple, and allows for economical and sturdy construction.

U.S. Pat. No. 4,676,174 discloses a worktable comprising two collapsible side frame assemblies, two collapsible cross frame assemblies, and a work surface. The side frame and cross frame assemblies are secured in the open position by the use of turnbuckles attached via hooks. The work surface has hooks which are used to secure it to vertically spaced slots which are on a U-shaped member attached to the side frame assembly.

U.S. Pat. No. 6,286,824 discloses a work table supported on a workhorse which is either collapsible or non-collapsible. The work surface consists of a member which can be attached to the top of the workhorse, and side work-plates which are collapsible. They are supported in the open position by support legs. The work surface includes various elements which are useful for receiving various hardware.

It is an object of the present invention to provide a worktable which is easily assembled and erected on a support structure, and can be easily disassembled and collapsed in such a way as to minimize its profile for compact transport and storage.

SUMMARY OF THE INVENTION

According to the present invention there is provided a work-plate mountable on a support structure, the support structure comprising at least two frames, each of the frames may either be an integral frame or comprising two or more frame members, articulated to one another along a vertical axis, and being pivotally displaceable with respect to one another between an open position and a collapsed position, forming, in the open position, a work-plate bearing structure, and being, in the collapsed position, flush with one another and providing a storage space for the work-plate; the work-plate being rigidly attachable to the work-plate bearing structure of the support structure.

The support structure may comprise a vertical post coincident with the vertical axis. The post, according to one particular embodiment, provides an arrangement to which the frames are pivotally hinged thereto. When the post extends from top to bottom, it provides a vertical load-bearing structure for the support frame.

According to one particular embodiment, when the frames are in the collapsed position, the work-plate may be attached to the post for compact transport and storage.

According to a characteristic feature of the invention, the support structure comprises two frames articulated about a vertical axis extending through the midpoint of said frames. The frames form, in the open position, an X-like shaped structure. The support structure may further comprise a vertical post coincident with said vertical axis.

In accordance with a modified embodiment, the frames may be attached to each other along their edges, forming, in the case of two frames, a V-like shaped support frame, or, in the case of more than two frames, a zigzag or a polygonal shape. According to this embodiment, a post may be provided at each point of attachment between two frames.

In accordance with another embodiment, the support structure may comprise three or more frame members articulate to one another about a vertical axis, and being pivotally displaceable with respect to one another between an open position and a closed position.

In accordance with a particular design of the invention, the work-plate may comprise a receiving member which is rigidly attachable to the work-plate bearing structure of the support structure, and at least one side plate which is articulated to the receiving member, providing for the work-plate to be in an open position or a collapsed position. Typically, the work-plate is to be rigidly attached to the work-plate bearing structure of the support structure while the support structure and the work-plate are in their respective open positions. When the support structure is in the collapsed position, the receiving member of the work-plate may remain attached to the work-plate bearing structure of the support structure and the at least one side plate of the work-plate may be collapsed, facilitating temporary storage of the worktable. The work-plate may further comprise at lease one projection extending from the bottom thereof, whilst the work-plate bearing structure comprises at least one receptacle adapted to snuggly receive the projection.

In accordance with a particular embodiment of the invention, the work-plate may be stored in the storage space provided within the support structure in the collapsed position. The thickness of the work-plate is such as to enable the work-plate to be substantially received within the storage space and still remain fully received and flush with the profile of the support structure in the collapsed position. This arrangement has the advantage of reducing the shipping volume of the worktable. It has the further advantage of requiring a smaller space for storage.

In accordance with another modification of the invention, the top portion of the support structure or of the work-plate may comprise one or more longitudinal V-like grooves. In the case of two or more grooves, the grooves are to be axially aligned to facilitate support thereon of a long bar, etc.

In accordance with another design, the support structure comprises at least one anti-slip shoe attached to the bottom portion of each of the at least two frames. The position of each anti-slip shoe may be independently vertically adjustable, facilitating stability of the frames on an uneven floor surface. In particular, each bottom corner of each of the at least two frames is to contain an anti-slip shoe.

The worktable may be used as a base for a board to serve as a job site worktable. Similarly, two such worktables may be used in conjunction with one another as a base for a long board to form a table.

In addition, the worktable may contain any or several of the following features:

- Indicia on the work-plate, typically adjacent to at least one edge of the work-plate, which are spaced in accordance with at least one standard system for linear measurement.
- Openings in the work-plate, useful for receiving and holding a variety of tools and accessories.
- A vice, the vice comprising an adjustable screw manipulable by a handle, a first jaw, and a second jaw facing the first jaw and being displaceable along an axis of said adjustable screw, said screw extending within the work-plate.
- One or more receptacles built into the work-plate, useful for storage of small pieces of hardware, drill bits, etc.
- An arrangement useful for locking the support structure at either an open position or a closed position.
- An arrangement for linking two or more worktables together.

BRIEF DESCRIPTION OF THE DRAWINGS

In order to understand the invention and to see how it may be carried out in practice, some embodiments will now be described, by way of non-limiting examples only, with reference to the accompanying drawings, in which:

FIG. **1** is a perspective view of an X-like shaped worktable according to the invention, in an open position;

FIG. **1**A is a partial section taken along line I-I.

FIG. **2** is a perspective view of the worktable in a collapsed position, with the work-plate articulated to the support structure;

FIG. **3** is a front perspective view of the worktable in its long-term storage position;

FIG. **3**A is a back perspective view of the worktable in its long-term storage position;

FIG. **4** is a perspective view of a modification of the invention, illustrating the support structure in the open position, wherein the frames are articulated at their ends, forming a V-formation;

FIG. **5** is a perspective view of a modification of the invention, illustrating the support structure in the open position, wherein the frames are articulated at the ends, forming a zigzag formation;

FIG. **6** is a perspective view of a modification of the invention, illustrating the support structure in the open position, wherein the frames are articulated at the ends, forming a closed polygonal formation;

FIG. **7** is a perspective view of a modification of the invention, illustrating the support structure in the open position, wherein the frames are articulated at the ends, forming an open polygonal formation;

FIG. **8** is an exploded perspective view of a frame comprising two frame members;

FIG. **9** is a plan view of a support structure in the open position comprising three frame members;

FIG. **10** is a perspective view of the work-plate, wherein several optional features of the worktable are shown;

FIG. **11** is an exploded perspective view of one embodiment of the worktable in an open position;

FIG. **12** is a perspective sectional view of a locking disk; and

FIG. **13** is a perspective bottom view of the work-plate according to a particular embodiment.

DETAILED DESCRIPTION OF THE INVENTION

The collapsible worktable provided by the present invention includes a support structure **10** (FIG. **1**) having a work-plate **12** supported thereon. The support structure **10** comprises at least two frames **14** pivotally articulated to one another along at least one vertical axis between an open position (FIG. **1**) and a collapsed position (FIG. **2**). Each frame **14** may be an integral frame or comprise two frame members **30** (FIG. **8**). The support structure **10** shall provide, in the open position, a storage space for the work-plate **12** (FIG. **3**). The thickness of the work-plate **12** shall be such as to enable it to be received within the storage space and remain fully received and flush with the support structure **10** in the collapsed position. In one embodiment, at least one optional vertical post **16** may be present, generally coincident with the at least one axis, providing a vertical support structure to the support structure. When the support structure **10** is in the collapsed position, the work-plate **12** may be rigidly attached to the post **16**.

According to this embodiment, the work-plate bearing structure **22** of the support structure **10** may comprise at least one receptacle **50** (FIG. **1**A). The work-plate **12** may comprise at least one projection **52** extending from the bottom thereof, which snuggly fits into said at least one receptacle **50**.

The worktable may comprise a locking disk **54** (FIG. **11**), comprising an upper portion, which comprises a structure to facilitate grasping. This structure, in one particular embodiment, comprises two arc-like depressions **56**, resulting in two portions **58** raised relative to the bottom of the depressions **56**. The locking disk **54** further comprises a downward circular projection **60**, having, at its end, and nub-like structure **62**. In this embodiment (FIGS. **11** & **12**), the locking disk **54** may be secured to the work-plate bearing structure **22** and the work-plate **12** by a bayonet connection as follows: central portions of the work-plate bearing structure **22** and the work-plate **12** each comprise an aperture **64** formed to receive the projection **60** with the nub-like structure **62**. The apertures **64**, for example as illustrated in FIG. **13**, each comprise a groove **64***a* to receive therein the nub, and are formed so that when the locking disk **54** is inserted thereto so that the nub-like structure **62** completely passes through, the locking disk **54** can be rotated to prohibit its removal. According to another modification of the invention (FIG. **11**), the post **16** comprises a similar aperture **66**. It is located at a spot on the post **16** so that the work-plate **12** can be secured to it with the locking disk **54** in the long-term storage position.

According to this embodiment, the work-plate **12** comprises a receiving member **18** which is rigidly attachable to a top portion **22** of the support structure **10**. At least one side plate **20** is articulated to the receiving member **18** between an open position (FIG. **1**) and a collapsed position (FIG. **2**). In the open position, the top surfaces of the receiving member **18** and the at least one side plate **20** are flush with each other. The receiving member **18** is of a width to allow the at least one side plate **20** to be in a fully collapsed position, i.e. collapsed in a downward direction generally orthogonal to the receiving member, providing a space adjacent the at least one work plate **20** for the support structure **10** to be in the collapsed position while the receiving member **18** remains rigidly attached (FIG. **2**).

In the normal course of operation, both the support structure **10** and the work-plate **12** are in the open positions (FIG.

1). In this operative position, the top surfaces of the support structure **10** are substantially flush with the top surface of the work-plate **12**.

According to another embodiment of the invention, the at least two frames **14** of the support frame **10** are articulated to each other at their ends. (FIGS. **4**,**5**, **6**, & **7**). The frames **14** may be opened to a V-shape, in the case of two frames (FIG. **4**). In the case of more than two frames **14**, they may be open to either a zigzag formation (FIG. **5**), a closed polygonal formation (FIG. **6**), or an open polygonal formation (FIG. **7**).

According to another embodiment of the invention (FIG. **9**), the support structure comprises at least three frame assemblies **30** articulated about a vertical axis. The support structure forms, in the open position, a hub and spoke formation.

The top portion **22** of the at least two frames **14** of the support structure **10** or of the work-plate **12** comprises one or more longitudinal V-like shaped recesses **24**. In the case of two or more grooves, the grooves are axially aligned to facilitate support thereon of a long bar, etc.

The bottom portion of the at least two frames **14** of the support structure **10** contains at least one anti-slip shoe **26**, particularly at each bottom corner of the frame **12**. The position of each anti-slip shoe may be independently vertically adjustable, facilitating stability of the frames on an uneven floor surface (FIG. **1**).

In addition, the work-plate **12** may contain indicia **28**, typically adjacent at least one edge of the work-plate **12**, which are spaced in accordance with at least one standard system for linear measurement (FIG. **10**).

The work-plate **12** may further comprise at least one opening **32** passing vertically through the work-plate, useful for receiving and holding a variety of hand tools (FIG. **10**).

The work-plate **12** may further comprise a vise **34** comprising an adjustable screw **36** manipulable by a handle **38**, a first jaw **40**, and a second jaw **42** facing the first jaw and being displaceable along an axis of said screw, said screw extending into the work-plate **12** (FIG. **10**).

The work-plate **12** may further comprise one or more recessed storage compartments **44**, useful for storing small pieces of hardware, drill bits, etc., with a closable lid **46**, such that, in a closed position, the lid is flush with the surface of the work-plate **12** (FIG. **10**).

The work-plate may further comprise handles **68** (FIG. **13**) useful for carrying the worktable in its long-term storage position.

The work-plate may comprise, on its lower portion, channel-like structures **70** (FIG. **13**) suitable for receiving the work-plate receiving structure **22** of the support structure **10**. It may further comprise a channel **72** suitable for receiving to post **16** in the long-term storage position.

The worktable may further comprise an arrangement **48** useful for locking the support structure into either an open position or a closed position (FIG. **2**).

The invention claimed is:

1. A collapsible worktable comprising:

(i) a support structure, having at least two frames articulated about a vertical axis; said frames being pivotally displaceable with respect to one another between a collapsed position and an open position and wherein a top portion of said frames forms, in the open position thereof, a work-plate bearing structure;

(ii) a work-plate, rigidly attachable over said work-plate bearing structure;

(iii) a post coincident with said axis; and

(iv) a locking disk rotatable with respect to the work-plate and having a projection with a nub structure constituting a quick-lock fastening structure;

said at least two frames, in the collapsed position of the support structure, being substantially flush with one another and providing a space for storage therewithin of the work-plate; said work-plate and work-plate bearing structure each comprising an aperture coincident with said axis so formed as to cooperate with said nub structure for securing of the work-plate over said work-plate bearing structure in its open position; said post comprising an second aperture so formed on a side of the post as to cooperate, together with the aperture of the work-plate, with said nub structure for securing of the work-plate to the post within said space in the collapsed position of the support structure.

2. The worktable according to claim **1**, wherein the post extends fully from the top portion of said frames to a bottom portion of said frames.

3. The worktable according to claim **1**, whereas the support structure comprises two frames articulated about a vertical axis approximately intersecting the midpoint of said frames; said frames forming, in the open position, generally X-shaped structure; the support structure further comprising said post.

4. The worktable according to claim **1**, further comprising at least one anti-slip shoe attached to the bottom portion of each of the at least two frames, said at least one anti-slip shoe being independently vertically adjustable.

5. The worktable according to claim **1**, further comprising at least two longitudinal generally V-shaped recess in the top portion of at support structure, said at least two longitudinal generally V-shaped shaped recess being axially aligned when the support structure is in the open position.

6. The worktable according to claim **1**, wherein the work-plate further comprises indicia, typically adjacent to at least one edge of said work-plate, said indicia being calibrated according to at least one standard method of linear measurement.

7. The worktable according to claim **1**, further comprising a vice, the vice comprising an adjustable screw manipulable by a handle, a first jaw, and a second jaw facing the first jaw and being displaceable along an axis of said adjustable screw, said screw extending into the work-plate.

8. The worktable according to claim **1**, wherein the work-plate further comprises a plurality of openings passing vertically through, useful for receiving and holding a variety of hand tools.

9. The worktable according to claim **1**, wherein the work-plate further comprises a recessed storage compartment with a closeable lid, said lid, in a closed position, being generally flush with the top surface of the work-plate.

10. The worktable according to claim **1**, further comprising a locking arrangement.

11. The worktable according to claim **1**, wherein:

(i) said locking disk comprises an upper portion having a structure to facilitate grasping;

(ii) said projection being a downward facing circular projection; and

(iii) each of said apertures being further formed of a size so as to receive said projection;

wherein the projection, nub structure, and aperture cooperate to secure the locking disk to the worktable by a bayonet connection.

12. The worktable according to claim **11**, wherein the work-plate further comprises a depression to receive the locking disk, wherein said locking disk is flush with the top surface of the work-plate in a locked position.

13. The worktable according to claim 11, wherein the work-plate further comprises at least one aperture formed to be useful as a handle when the work-plate is attached to the post.

14. The worktable according to claim 1, the work-plate further comprising channel structures to receive the work-plate bearing structure in the open position.

15. The worktable according to claim 1, the work-plate further comprising a channel structure to receive said post when the work-plate is fully received within the support structure in the collapsed position.

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